Droplet No. 10 **16th December 2007**

This Droplet explores the question of how best to charge people for the water they use at home.
Droplets explore ideas and propositions which, if developed further, might improve water use. They develop ideas and search for the fundamental concepts and building blocks that one might consider if not constrained by prior decisions.

Pricing your water: Is there a smart way to do it?

"For anything worth having, one must pay the price....." John Burrows - an American author, 1837-1921.

The issue

A recent National Water Commission (NWC) stock take reveals an amazing array of charging regimes for household water use. The stock take of 57 of Australia's urban supply systems found that

- 25 set a fixed service charge and then add an "inclining block" charging regime on top of this fixed charge that increases the charge per kilolitre (Kl) in a number of steps;
- 4 use an "inclining block" regime without a fixed service charge;
- 1 uses a "declining" block regime; and
- 24 use a "two part" tariff regime that superimposes a volumetric charge on a fixed service charge; and
- 3 apply a service charge only and don't charge for the amount of water used.

The record for the maximum number of "inclining blocks" goes to Busselton Water with an eight block regime. You pay $0.48/Kl for the first 150 Kl, $0.62 for the next 150 Kl, etc. Over 1,950 Kl per annum, you pay $2.53/Kl. Busselton, however, does not set a fixed service charge.

Lower Murray Water is the only water supplier with a seasonal charge. Water is cheaper in winter.

Given the state of our water supply systems, what is the best way to charge for and ration household water use? Have any water suppliers of the 57 supply systems got it right or have they all got it wrong?

Clarification of objectives

Unfortunately, governments tend to use water pricing regimes to achieve equity, environmental, revenue and economic efficiency objectives simultaneously. This approach violates a golden rule in policy development, to avoid conflicts – use a separate instrument to achieve every objective and, once an instrument is assigned to one objective, don't try to use it to achieve another objective.

Economic efficiency when there's lots of water

What we pay influences what we do and what we buy. If water is abundant, then the efficient price to set is the long-run marginal cost of supplying one more kilolitre – including management costs, the costs of being the supplier of last resort and providing a return on capital.

The next step in pursuing efficiency is to charge according to the actual costs of delivering water to each suburb in each season. In regions where delivery costs vary significantly, this means that postage stamp pricing arrangements need to be replaced with city or town by town pricing arrangements.

Further, it is also necessary for the cost of upstream environmental and other externalities to be reflected in your water supply bill. To encourage you to manage for downstream externalities, however, these need to be charged separately and in proportion to their extent.

Once built, the cost of maintaining and depreciating all infrastructure becomes part of the long-run marginal cost of water supply. The more supply reliability you want, the more you have to pay per kilolitre. Desalination plants, for example, are expensive and, once built, have to be paid for. Great when there a water shortage but an expensive white elephant if there is lots of water around.

Economic efficiency when water is scarce

When it unexpectedly gets or stays dry, water supplies have to be rationed. There are two ways to ration water use. One way is to introduce water restrictions which impose indirect costs on many people. The other way is to increase the price.

Economic research keeps on pointing to the fact that water users respond to price increases. Pragmatic as ever, Quentin Grafton recommends that the best way to set a scarcity price is to estimate the amount of water in storage every quarter and charge accordingly. As dam storage goes down, the price goes up. To drive home the scarcity message, meters need to be read and bills sent, at least, quarterly. In the USA, many utilities read every meter every month.

As outlined in Droplet 5, another way of achieving the same outcome, is to allow urban water trading. Set the maximum amount of water that an average household can use in a quarter and let those who really want water buy it from those prepared to sell.

In times of scarcity, the water supplier collects more money than is needed to cover costs. Some people think that this money should be returned to users, others think it should be used to finance new infrastructure. Either way, it is quite clear that there is a need to change the way we charge for water.

Equity

Many people think that water, especially non-discretionary water (water used inside houses), should be supplied at an "affordable" price. This is why there is so much interest in inclining block tariff regimes. "Affordable" is code for not having to pay for the full cost of the water delivered. The idea is that the first amount of water you use should be cheap. Those who use lots of "discretionary" water (gardens, pools, etc) should have to pay more for it. The result is a cross-subsidy from large water using households to small water using ones. At first glance, this may seem reasonable.

But when you dig a bit deeper, it becomes clear that inclining block tariff regimes transfer money from disadvantaged households to richer ones which, as a result of the block regime, gain access to cheap water. Concerned that inclining block systems are inequitable, John Quiggin has shown that if you want to help disadvantaged households, it is better to set a uniform charge and then pay rebates to every-one or only to those in need. In short, use separate policy instrument to chase each objective you are interested in. Remember, however, that typical per capita household use is around 46 kilolitres per year. At current prices, the cost of this water is less than the cost of running an old fridge in your garage.

Inclining block tariffs are inequitable also because most of them are implemented on top of a fixed service charge. For the 25 NWC's water supplier utilities who combine an inclining block tariff with a fixed service charge, the average fixed service charge is $124 per household. If you use of 100 kilolitres per year and are charged $0.50 per kilolitres for this first block of water, the real cost per kilolitre delivered to you is $1.74/ kilolitres. This is not cheap water.

Revenue

The real reason water supply utilities set fixed charges is that this guarantees them a revenue base. These utilities are monopolies but it is hard to argue that they should not be subject to the same pricing disciplines as other businesses. In summary, inclining block tariff systems represent a clumsy attempt to achieve efficiency and equity objectives simultaneously. We believe they should not be used.

Where to from here

With all these arrangements in place and if we leave sewage connection charging arrangements for another day, several guidelines for household water pricing emerge.

1. Send an efficient price signal to everyone by charging them the same for every kilolitre of water they use.
2. Send a scarcity signal to all water users. Read meters and send out a bill quarterly. Expect un-metered apartments to start applying for meters.
3. Inclining block tariff systems should be phased out – they are very inequitable.
4. Fixed water service charges should be phased out – for a monopoly, revenue protection is unnecessary.
5. Only help those in need and use targeted programs to do this. Consider increasing Centrelink and pension payments instead.
6. In times of abundance, supply water at the long run marginal cost of securing an additional unit of water. Plan well but recognise that the cost of building excess supply capacity can be high. Take some risk and use scarcity pricing and/or trading to get out of short-term trouble.
7. In times of scarcity, change the price every quarter according to a formula or use an independent price regulator to do the same thing or give households the option to trade water.
8. Keep water restrictions to a minimum and contemplate using them only after the scarcity price has risen by several orders of magnitude.

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